Helping infants and toddlers in Foster family care

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Optimizing foster family placement for infants and toddlers

A randomized controlled trial on the effect of the Foster carer - Foster child Intervention (FFI)

Based on:
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ABSTRACT

Background: The relationship between foster children and their foster carers comes with many risks and may be very stressful both for parents and children. We developed an intervention (Foster carer - Foster child Intervention, FFI) to tackle these risks. The intervention focuses on foster children below age 5.

Objectives: To investigate the effects of the FFI on the interactions between foster parents and foster children.

Methods: A randomized controlled trial was carried out with a sample of 123 preschool aged children (mean age 18,8 months, 51% boys) and their foster carers. A pretest was carried out 6-8 weeks after placement, and a posttest half a year later. Interactions were videotaped and coded using the Emotional Availability Scales. Foster carers were asked to fill in the Dutch version of the Parenting Stress Index. Morning and evening samples of children's salivary cortisol were taken.

Results: In the posttest, significantly positive effects were found on EAS subscales Sensitivity, Structuring, Non-Intrusiveness and Responsiveness. We found no significant differences on stress levels of foster carers and children (NOSI domains, salivary cortisol). Conclusions: This study shows that the FFI has a significant positive effect on parenting skills as measured with EAS and on responsiveness of the foster child. Findings are discussed in terms of impact and significance relating to methodology and design of the study and to clinical relevance.

Key words
Family foster care, infants, toddlers, intervention, evidence base, stress

6.1 INTRODUCTION

Placement in a foster family is a major life event for young children. It often happens unexpectedly and without a proper preparation. The loss of the nuclear family is a traumatic experience (Bruskas, 2008; Samuels & Pryce, 2008). Children have to deal with conflicting emotions and loyalty towards their biological parents (Leathers, 2004). Often a history of neglect is present, which influences the way a child interacts with the environment (Strijker & Knorth, 2007). Many foster children come from impoverished home situations and a large majority of them have experienced trauma and/or toxic stress in the form of abuse and neglect (Bruce, Fisher, Pears, & Levine, 2009).
The child may mourn on the loss of his/her nuclear family and has to develop new attachment relations in the foster family at the same time. The child may have loyalty problems, for example because the biological parent does not agree to the placement or because of conflict between the biological parent and the foster carer.
Non-kinship foster carers and foster children do not have a joint history. It seems clear that the developing relationship between the foster carer and a young foster child is precarious in many ways. It is plausible that the stress in the foster child may go unnoticed because the child often reacts to the foster carer in a shut-down way. The foster carer may not notice the negative effects on the well-being of the child (Van Andel, Post, Jansen, Kamphuis, Van der Gaag, Knorth, & Grietens, 2015, submitted). The conflicting emotions of the child and the insecurity in the relation with the foster carer may lead to elevated stress levels in the child (Dozier, 2006; Leathers, 2004).
As a result, children who enter foster care at an early age do so with a myriad of challenges, including developmental delays, mental and physical health problems, and attachment disorders (Dicker, Gordon, & Knitzer, 2001; Jonkman, Verlinden, Bolle, Boer, & Lindauer, 2013; Vig, Chinitz, & Shulman, 2005). Many foster children have adverse caregiving experiences and may therefore be at risk for multiple adversities, including neuroendocrine dysfunction (Cicchetti & Rogosch, 2001; Dozier et al., 2006), behavioural problems (Bernedo, Salas, Garcia-Martin, & Fuentes, 2012; Vanyukov, Moss, Plail, Blackson, Mezzich, & Tartre, 1993), delay in intellectual development (Pears, Fisher, Bruce, & Kim, 2010), attachment problems (Cicchetti, Rogosh, & Toth, 2006; Pears, Fisher, Bruce, Kim, & Yoerger, 2010) or somatic illness (Heim, Ehlert, & Hellhammer, 2000).

Foster carers have to deal with the child's (problem) behaviour and to provide a secure and stable environment for the child (Zeanah & Dozier, 2011). This is a complicated and relevant task. Recent research has shown that caregiver characteristics better predict placement stability and developmental outcomes than foster child characteristics do (O'Neill, Risley-Curtiss, Ayon, & Rankin-Williams, 2012). Further, Leathers (2006) found that children who had been able to form secure relationships in their original home

environment were less likely to disrupt in foster care and that these relationships moderated the effects of problem behaviour. Children who felt supported by their caregivers developed less problem behaviour after being placed in foster care (Denuwelaere & Bracke, 2007).

Foster carers do not always recognize the subtle signals of stress in the child (Van Andel et al., 2015, submitted). Specifically, they may not recognize children's 'avoidant' way of adapting to the new situation. As a result, they may not meet the child's need for emotional security and not adequately manage the child's stress. Family-based interventions might help the foster carer to build a secure relation with the child. However, there are very few effective interventions targeting the specific needs of very young foster children (0-4 years of age) and their carers (Van Andel, Strijker, Grietens, Van der Gaag, & Knorth, 2014). For this reason, we developed the *Foster carer – Foster child Intervention (FFI)* in 2009, thereby trying to support foster carers in recognizing and coping with the stress foster children under the age of five may experience after having been placed in their family (Van Andel, Grietens, & Knorth, 2012).

The FFI is carried out by trained professionals and aims to improve the interaction between foster carers and foster children by optimizing carers' emotional availability, as well as parenting skills and self-confidence. The intervention is designed with inclusion of principles from attachment theory, psycho-education, mindfulness therapy, and video reflection. Each session has a specific inter-relational theme (a.o. observing your child, managing emotions of your child, managing avoidance behaviour of your child). The themes progress from an individual to a family focus, and include more relaxed/non-threatening, as well as more tense/threatening situations (Van Andel et al., 2012).

The core idea of the intervention is that by influencing the foster carer to be mindful and sensitive to the child, he/she in turn influences the foster child in a positive way (Brok & De Zeeuw, 2008; O'Neill et al., 2012). The FFI focuses on the foster carer's position, feelings, perceptions and observational skills, and how these may influence the interaction with the child.

In this study, we will investigate the outcomes and efficacy of the Foster carer - Foster child Intervention compared to the outcomes of regular foster care in a care as usual group (CAU). The research questions are: 1) What is the effect of the FFI on foster carers' perception of the child? 2) What is the effect of the FFI on foster carers' behaviour towards the child compared to CAU?, and 3) What is the effect of the FFI on the child's reactions toward the foster carer and on the child's level of stress compared to CAU?

6.2 METHOD

6.2.1 Design

We used a randomized controlled trial pretest/posttest design with a FFI group and a CAU group as the two conditions to be compared. The planned trial design should include 160 children, as the estimated sample size needed to get an estimated Effect Size between 0.30 and 0.60 (medium/large effect), compared to existing interventions (Hulley et al., 2007; Van Andel et al., 2014). After registering potential cases, we first made sure that all inclusion criteria (see below) were met. Then, the child /foster carers couples entered our study and were given the first available number from a computer-generated list, which randomly assigned the case to the FFI- or CAU-condition. The study was carried out, with a first measurement (pre-test, T1) 6-8 weeks after placement and a second measurement half a year later (posttest, T2). The foster carers in the intervention group started the FFI 8-10 weeks after the child had been placed in foster care, the control group received care as usual (regular foster care support). It was agreed upon that foster carers who received FFI did not receive CAU at the same time or vice versa. The foster care workers in the FFI group did not carry out CAU during the period of data collection.

Care as usual (CAU): CAU consists of home visits every 2-6 weeks in order to monitor the placement. The purpose is to support foster carers and to organize extra help where needed. In the first six weeks of the placement a plan is made in which it is agreed upon how foster carers, biological parents and foster care will work together and which goals will be pursued.

Foster carer – Foster child Intervention (FFI): In six 90 minutes home visits, foster care workers support foster carers by:

- providing information ('what and why': focusing on the carers' perceptions of their interaction with the child; 'how': focusing on other possible ways to interact with the child);
- helping to reflect on videotaped recordings of parent-child interactions (first three sessions with successful and relaxed interactions, next three sessions with unsuccessful and more stressful ones);
- discussing homework assignments (suggested reading: chapters from the book by Brok & De Zeeuw, 2008).

The sessions follow a fixed protocol and are led by trained foster care workers (see De Zeeuw et al., 2010). The home visits take place once a fortnight, covering a period of maximum three months.

6.2.2 Sample

A convenience sample of twelve foster care organizations in the Netherlands (out of the 28 organizations) participated in the study. Children and foster carers were included if the data collection could be carried out within 6-8 weeks after placement and after informed consent was given by foster carers and biological parents. Excluded were children with birth deficits, severe cognitive dysfunctions and children with psychiatric problems receiving treatment. Furthermore, the expected placement duration had to be at least six months. The Ethical Commission on Human Research of the University Centre St. Radboud, Nijmegen, approved all procedures. Data were collected between July 2009 and August 2013 and had to stop before we collected all 160 cases because of financial pressures. Based on the criteria mentioned above, 123 infants and toddlers could be included. In the pretest we obtained 123 EAS video observations. 110 NOSI questionnaires were returned and filled in correctly. Further, 104 x 2 (morning and evening) samples of salivary cortisol could be processed.
Information from case files was collected on demographics (age, gender), placement characteristics (number of replacements, (non)kinship care, duration of placement, possible maltreatment of child), and foster family characteristics (experience in foster care, other children present in foster family, contact with biological parents). The information was used to assess the comparability of the intervention and control group. Missing values in the post-test group were partly due to replacement of the foster child (dropout) before post-test data could be collected (*N*=27). As a result, 96 EAS observations in the posttest could be included. In addition to dropout, ten NOSI questionnaires were not filled in correctly resulting in 86 NOSI questionnaires in the post-test dataset. Thirty-seven salivary cortisol results were missing in the posttest because foster parents did not collect the material or the child was not able to participate in the follow-up, resulting in 59x2 (morning+ evening) samples of salivary cortisol in the post-test dataset. Missing values were equally distributed between FFI and CAU in pretest as well as posttest.

6.2.3 Instruments

As a primary outcome measure we used the Emotional Availability Scales (EAS) (Biringen, 2008). This instrument evaluates videotaped interactions between carers and children. To evaluate foster carers' perception of the child including the stress they experience in raising the child, they were asked to complete the Dutch version of the PSI (Parenting Stress Index; Abidin, et al., 1992) called the NOSI-R (in Dutch: Nijmeegse Ouderlijke Stress Index Revised; De Brock, Vermulstm, Gerris, Veerman, & Abidin, 2010). As a secondary measurement we evaluated biological markers of foster children's stress levels with samples of salivary cortisol; it is indicated that cortisol diurnal activity reacts to variations in care quality among infants and toddlers (Gunnar & Donzella, 2002).

Emotional Availability Scales (EAS) - The Emotional Availability Scales refer to a semi-structured procedure used to assess dyadic interactions between an adult and a child (Biringen, 2008). Parental and child associations between EAS scales characterize the global emotional quality of the parent-child relationship. The instrument covers six dimensions to be rated. Four dimensions relate to the adult's contribution in the interaction: sensitivity, structuring, non-intrusiveness, and non-hostility. Two dimensions focus on the child's part: responsiveness and involvement. All six scales can be scored from 7 to 29 points. Scores above 18 are considered to be acceptable to good (Biringen, 2008), which implies a positive interaction between parent and child and a sufficient engagement to each other. Acceptable psychometric properties have been reported on the EAS, including inter-rater reliabilities of the scales in the range of .76-.96. Studies have confirmed hypothesized relations between EAS scores and child–mother attachment, as well as attachment to professional caregivers (Biringen et al., 2012). Other studies have affirmed the expected links between EAS profiles and characteristics of caregivers (e.g., mental health) and children (e.g., children with disabilities) (Biringen, Derscheid, Vliegen, Closson, & Easterbrooks, 2014).
Foster carer - foster child interactions were videotaped, both in the pre-test and in the post-test, and afterwards rated using the EAS guidelines. The tapes were scored twice by two independent groups of trained professionals (two persons, licensed by Biringen to use EAS, 4th ed. 2008) and trained students (4-6 persons, in company training EAS 4th ed. 2008). If scores per dimension between the two groups differed more than five points, the tape was analyzed a third time with both groups together and a consensus score was established after discussion. If scores per dimension differed less than five points, the mean score was taken.
NOSI [Nijmeegse Ouderlijke Stress Index] - The Dutch version of the PSI (Parenting Stress Index; Abidin et al., 1982), called the NOSI-R (in Dutch: Nijmeegse Ouderlijke Stress Index Revised, NOSI-R; De Brock et al., 2010), is a self-report questionnaire to measure stress in the family. The NOSI-R contains 75 items, describing the degree of stress, experienced by parents, in two domains: (1) the Parent domain rating the extent of stress the parent experiences in his/her role as a parent; and (2) the Child domain rating parents' estimation of child factors that contribute to stress in the parent-child relationship. The items are rated on a 4-point scale (totally not true / totally true). The total score in the two domains is compared with a norm score in which age of the child is taken into account. Scores above the norm indicate stress in the relation between child and carer. The reliability between parents (parent domain .94; child domain .95) is high and validity of the NOSI has been assessed as sufficient/good (Evers et al., 2000).
Salivary cortisol - Saliva was routinely collected twice, once in the morning and once in the afternoon to assess diurnal variation in cortisol levels (Kiess, Meidert, Dressendorf, Schriever, Kessler, Schwarz, & Strasburger, 1995). The first sample was obtained in the

morning within half an hour after awakening; the second sample was obtained before going to sleep in the evening of the same day. Foster carers followed a standardized written instruction. In the written instruction it was emphasized that samples should be taken on an ordinary day with no acute stressors present or to be expected (like illness, visits of biological parents). Furthermore, it was emphasized not to brush teeth within half an hour before the measurement (possible contamination with blood), and to carry out the second measurement at least half an hour after dinner on the same day as the first measurement.
Saliva was collected using Salivettes with polyester wad (Sarstedt Ltd.) and subsequently analyzed using Ultra Performance LC (UPLC) followed by tandem quadrupole mass spectrometer (Waters, Milford, MA, USA). The lower detection limit was 0,68 nmol/lt, mean intra-assay and inter-assay coefficients of variation were respectively 2,6% and 5,9%. Only a small amount of saliva is needed to measure cortisol (Srivastava, Sharma, Uttam, & Neha, 2010).

6.3 DATA ANALYSES

First, we tested whether there were differences between the FFI and CAU group with regard to the independent variables, clustered in demographic, placement and foster family groups, thereby using χ^2 tests and t- tests. Furthermore, we compared all dependent variables in the pre-test using independent t-tests.
To analyze the effect of the intervention on EAS, NOSI and cortisol values, multilevel linear regression models were used with children as the highest level and the measures (pretest and posttest) as the lowest level to account for dependencies between measures within children. We started for all dependent variables by applying an empty model (a model without explanatory variables). This was followed by a final model with time (pre-test versus post-test measures) and the interaction between time and group (FFI/CAU) as explanatory variables. In the model analyzing the role of cortisol we also included the explanatory variables time of the day (morning versus evening measures), together with the interaction between time and time of the day.
We did not include group as a main effect in the models in order to force them to estimate equal pretest means for both groups (which might be expected under randomization). Fixed as well as random effects were included. The difference in deviances of the empty model and the corresponding final model was used to determine whether the final model was better (in terms of fit) than the empty model. P-values < 0.05 were considered to be significant. Hence we calculated the Effect Sizes (ES) of the intervention effect.
To address the first question, we used this procedure on NOSI-R parent, NOSI-R child and NOSI-R total outcome. To address the second question we used this procedure on EAS Sensitivity, EAS Structuring and EAS Non-intrusiveness outcome. We did not include the domain Non-Hostility because this did not differentiate. All parents scored

higher than 20 points in both groups in the pre-test as well as in the post-test without significant differences. To address the third question we used the same procedure on the child domains of the EAS and on salivary cortisol. For the cortisol measures we used a log transformation to account for the profound difference in dispersion between morning and evening measures; indeed, cortisol concentrations were not normally distributed and showed a variable dispersal with many outliers. The transformation was not completely successful because the resulting distribution was not a normal one.
Multilevel analysis was performed in MLwin, version 2.23. All other analyses were performed in SPSS, version 22.0.

6.4 RESULTS

6.4.1 Pre-test sample characteristics

In total 123 children were included, 51% of them were boys. The mean age of the children at the entry of the study was 18,8 months (*SD* = 14,5 months) with 36% being younger than 9 months. Sixty-five children received the FFI intervention, 58 children received regular foster care (CAU).
Table 1 shows characteristics of the FFI- and CAU-group in the pretest. They are listed in three different clusters: demographic, placement, and foster family characteristics. Variables were considered as missing when not found in the files of the foster care agency. No significant differences between the FFI- and CAU-group were found.

Table 1 Demographic, placement and foster family characteristics for pretest Foster carer - Foster child Intervention group (FFI) and Care as Usual group (CAU)

Variable	FFI (n=65)	CAU (n=58)	Statistics
Characteristics foster child			
Gender (% boys)	49%	51%	χ^2 = .69, df=1, p=.41
Age: Mean in months (Mean ± SD)	19.7 ± 14.4	17.9 ± 14.7	t = -.65, df=121, p=.52
Age: % < 9 months	34%	38%	χ^2 = .22, df=1, p=.64
Placement characteristics			
None or one replacement (n=117)	77%	88%	χ^2 = 2.17, df=1, p=.14
Non-kinship foster placement (n=115)	85%	83%	χ^2 = .08, df=1, p=.78
Long term placement (n=114)	65%	62%	χ^2 = .14, df=1, p=.71
Maltreatment of the child (n=114)	93%	89%	χ^2 = .70, df=1, p=.40
Foster family characteristics			
No former experience as foster carers (n=91)	68%	63%	χ^2 = .21, df=1, p=.65
Other children living in foster family (n=92)	58%	74%	χ^2 = 2.52, df=1, p=.11
Contact with biological parents (n=89)	79%	88%	χ^2 = 1.18, df=1, p=.39

Table 2 shows the Mean and SD of EAS-scores on pretest and posttest in FFI- and CAU-group. With t-tests significance of pre-test differences between FFI and CAU were calculated. Notable is that all pre-test domains show a significant positive difference except for the domain Non-Intrusiveness.

Table 2 Mean and SD in EAS domains in pretest and posttest

	PRETEST			**POSTTEST**	
	FFI	**CAU**	**Difference FFI-CAU on pretest**	**FFI**	**CAU**
Measure	M ± SD	M ± SD	t-test	M ± SD	M ± SD
EAS	n=65	n=58		n=47	n=48
Sensitivity	19.20 ± 3.69	21,55 ± 3.39	t=3.66, df=121, p<.001	22.70 ± 2.56	21.29 ± 3.45
Structuring	19.28 ± 3.43	21,31 ± 2.93	t=3.52, df=121, p=.001	22.53 ± 2.30	21.40 ± 3.48
Non-intrusiveness	20.38 ± 3.34	21,36 ± 3.53	t=1.58, df=121, p=.12	22.34 ± 2.70	20.85 ± 3.22
Responsiveness	17.09 ± 3.13	18,72 ± 3.40	t=2.77, df=121, p=.006	21.30 ± 3.11	19,89 ± 3.12
Involvement	15.98 ± 3.53	17,45 ± 3.58	t=2.28, df=121, p=.024	19.79 ± 3.25	19.30 ± 3.50

Table 3 shows the Mean and SD, as well as possible significant associations on NOSI-R domains in pretest and posttest. No significant pre-test differences between FFI and CAU are present.

Table 3 Mean and SD in NOSI-R domains in pretest and posttest

	PRETEST			**POSTTEST**	
	FFI	**CAU**	**Difference FFI-CAU on pretest**	**FFI**	**CAU**
Measure	M ± SD	M ± SD	t-test	M ± SD	M ± SD
NOSI	n=59	n=51		n=45	n=40
Parent domain	55.59 ± 15.21	53,96 ± 11.60	t =-.63, df=108, p=.53	54.13 ± 13.20	52.90 ± 15.12
Child domain	58.59 ± 18.92	55.29 ± 16.07	t =-.98, df=108, p=.33	57.51 ± 18.97	58.35 ± 19.54

6.4.2 Intervention effects on foster parent and foster child

After applying the empty model on the EAS parent and child domains, we included time (pretest/posttest) and time x group (FFI/CAU) as explanatory variables in our final model. The analysis showed there was no main effect of time (see final model Table 4), indicating that there was no significant difference in time scores. The outcomes of the analysis revealed a significant effect between conditions on all EAS domains (except Involvement) after having participated in the intervention group, which indicates that the effect over time is more positive for the FFI group.

Table 4 Estimates for the variable effects on EAS domains between CAU and FFI for different models

EAS	**Sensitivity**	**Structuring**	**Non-Intrusiveness**	**Responsiveness**	**Involvement**
Model	**Estimates (SE)**		**Empty model**		
Fixed part					
Intercept	21.03 (0.26)	20.96 (0.24)	21.15 (0,25)	19.05 (0,24)	17.92 (0.26)
Random part	Variance				
Level 2	2.76 (1.31)	2.22 (1.31)	3.73 (1.15)	0.00 (0.00)	0,00 (0.00)
Level 1	9.90 (1.41)	8.64 (1.23)	7.08 (1.02)	12.45 (1.20)	14.22 (1.37)
Deviance	1167.50	1129.41	1120.47	1163.02	1191.93
Fixed part			*Final Model*		
Intercept	20,30 (0,34)	20.23 (0.30)	20.85 (0.31)	17.86 (0.30)	16.68 (0.32)
Time [1]	0,49 (0,44)	0.61 (0.43)	-0.15 (0.44)	2.02 (0.54)	2.57 (0.57)
Time x group[2]	2,49 (0,56)*	2.16 (0.55)*	1.77 (0.55)*	1.44 (0.64)*	0.61 (0.69)
Deviance #	1131.17	1096.80	1104.89	1123.32	1156.75

* : significant $p < .05$
#: random effects not included
[1] Pretest is reference category for times
[2] CAU is reference category for group

Figure 1 shows a graphical presentation of the model estimates for the variable effects on the three EAS domains between CAU and FFI in the final model, with time and group as explanatory variables.

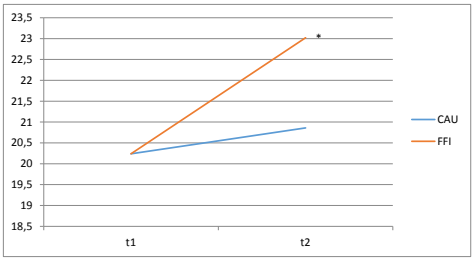
In the posttest, the differences between the FFI intervention and CAU condition on Sensitivity, Structuring, Non-intrusiveness, Responsiveness, and Involvement are in favour of the first (only in the domain Involvement not significant). Effect Sizes (ES) can be computed by dividing the estimated intervention effect with the pooled SD. In this case, the ES is 0.82 for Sensitivity, for Structuring the ES is 0.73, for Non-Intrusiveness it is 0.60, for Responsiveness it is 0.46 and for Involvement 0.18.

Mean scores on NOSI Parent/Child/Total domain in the FFI and CAU group differed not significantly between pretest and posttest.

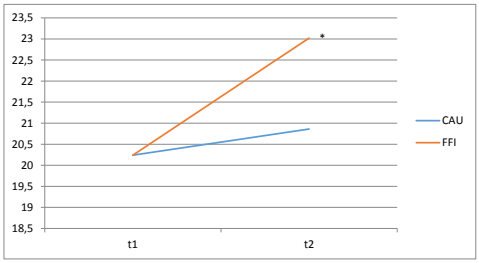
Table 5 shows the final model in MLwin on NOSI-R outcomes with time (pretest measures versus posttest measures) as well as the interaction between time and group (FFI/CAU) as explanatory variables.

Figure 1: Presentation of MLwin estimates in pretest/posttest final model EAS domains

EAS Sensitivity

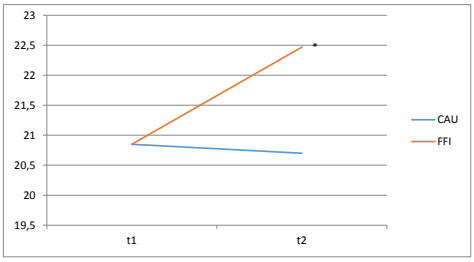


EAS Structuring



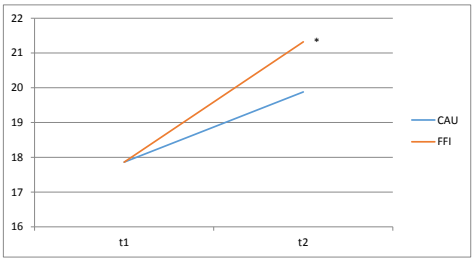
*significant on T2

EAS Non-Intrusiveness

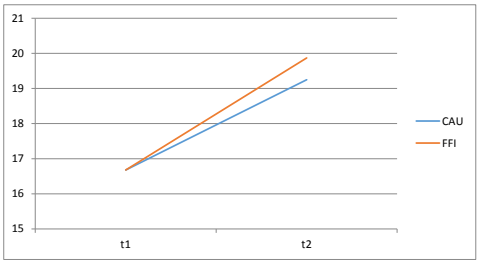


*significant on T2

EAS Responsiveness



EAS Involvement



*significant on T2

Table 5 Estimates for the variable effects on NOSI-R domains between CAU and FFI for different models

Model	NOSI-R Parent	NOSI-R Child	NOSI-R Total
	Estimates (SE)		
Fixed part		Empty model	
Intercept	54.73 (1.9)	57.78 (1.62)	112.54 (2.66)
Intercept	Variance		
Random part			
Level 2	159.00 (25.28)	235.64 (40.64)	663.32 (107.27)
Level 1	46.22 (7.22)	99.82 (15.47)	207.52 (32.21)
Deviance	1515.47	1630.97	1801.39
Fixed part		Final model	
Intercept	54.99 (1.30)	57.18 (1.68)	112.18 (2.70)
Time [1]	-1.52 (1.50)	3.15 (2.16)	1.78 (3.19)
Time *Group[2]	1.81 (2.05)	-2.96 (2.92)	-1.37 (4.34)
Deviance #	1512.24	1627.74	1799.38

* : significant (< .05)
#: random effects not shown
[1]: pretest is reference category for times
[2]: CAU is reference category for group
There are no significant differences over time in NOSI parent, NOSI child or NOSI total scores between FFI and CAU groups, indicating that there is no intervention effect.

Table 6 shows the pretest/posttest means and SD of salivary cortisol in nmol/l.

Table 6 Pretest and posttest outcomes of salivary cortisol

Pretest	FFI	CAU	
Cortisol	n=59	n=45	
Morning (nmol/l)	9.19 ± 11.16	7.66 ± 6.92	t = -1.24, df=102, p=.22[#]
Evening (nmol/l)	1.70 ± 2.44	1.99 ± 3.27	t = -0.06, df=102, p=.95[#]
Posttest			
Cortisol	n=30	n=28	
Morning (nmol/l)	8.59 ± 6.35	6.83 ± 4.14	t = -0.88, df=55, p=.38[#]
Evening (nmol/l	4.09 ± 9.46	1.10 ± 1.01	t = -2.57, df=55, p= .013[#]

[#] Based on log-transformation

The rather high mean and SD posttest evening cortisol concentration in the FFI group is due to many outliers.

Multilevel analyses with salivary cortisol were carried out to determine pretest/posttest, time/group, morning/evening and time/time of day effects. In the final model, we included the explanatory variables time of the day (morning versus evening, pretest measures versus posttest measures), as well as the interaction between time and group (FFI/CAU) as explanatory variables (Table 7).

Table 7 Estimates for the variable effects on logcort between CAU and FFI for different models without random effects

	Empty model		**Final model**
Models	**Estimates (SE)**		**Estimates (SE)**
Fixed part		*Fixed part*	
Intercept	0.92 (0.07)	Intercept	1.67 (0.11)
Random part	Variance	Time[1]	0.04 (0.22)
Level 2	0.00 (0.00)	Time of day[2]	-1.53 (0.11)
Level 1	1.52 (0.12)	Time x Time of day	-0.26 (0.22)
deviance	847.97	Time x group[3]	0.08 (0.25)
		Time x time of the day x group	0.38 (0.26)
		Deviance##	847.97

* : significant ($p < .05$)
[1]: pretest is reference category for time
[2]: morning is reference category for time of day
[3]: CAU is reference category for group
random effects not shown

The final model on logcort does not show any significant interaction effects between groups, time or time of day, indicating that there is no significant difference between both groups at the posttest.

6.5 DISCUSSION

As far as we know, this study is one of the first, trying to collect evidence on an intervention aimed at improving mutual relationships in family foster care. Furthermore, the study is quite unique in targeting infants and toddlers in a foster care setting. The study focuses on looking for evidence on the effect of the Foster carer - Foster child Intervention (FFI) regarding improvement of the mutual relationship between the child and its foster carers. It showed a positive effect on interactional outcomes as measured in the EAS, which was the primary outcome measure.

We found a positive effect on the *parent domains* Sensitivity, Structuring and Non-intrusiveness. The difference between FFI and CAU scores on these domains in the posttest is approximately 1,5 point, which is not a large difference. But when we consider the difference between pretest and posttest scores, FFI scores have grown much more than CAU scores. The Effect Sizes vary between 0.60 and 0.82, which corresponds according to Cohen (1992) with a medium to large effect.

We also found a positive effect on the EAS *child domains*: Mean scores on Responsiveness and Involvement have more improved between pretest and posttest in FFI compared to CAU. Effect Sizes were 0.46 and 0.18 respectively, which corresponds according to Cohen (1992) with a small to medium effect. The results indicate that not only the carers in the FFI group benefit from the intervention but the children as well. The more favourable

scores on Responsiveness (and Involvement to a lesser degree) in the intervention group might indicate that the child benefits from improved parenting practices of foster carers. This points to an overall intervention effect on all the relevant EAS domains.

At the same time, however, we did not find an intervention effect on the secondary outcome measures: the NOSI-R domains and salivary cortisol. In trying to understand these findings we should realize that the mean EAS pretest outcome scores on parent domains were all above 19 points. This indicates that the quality of the foster parenting skills on average is sufficient/good (Biringen, 2008). It is also notable that mean cortisol levels were not very high, which may implicate that the children are not so stressed as we expected them to be. These combined results may - at least in part - explain why we did not find an intervention effect on salivary cortisol. It is possible that foster carers are able to 'contain' the child's stress because they have well-developed parenting skills; it is also possible that the child does not suffer from stress; or both possibilities count. This also might explain why the majority of the foster carers do not report stress in the relationship with their foster child.

Our intervention group was composed of a younger age than we expected when starting this study with 34% younger than nine months of age. Therefore, another factor that might explain the findings is that the NOSI-R may not distinguish stress symptoms at this very young age because it primary focuses on children older than two years of age. It is rather difficult to find a reliable questionnaire focusing on infants and toddlers. Staal, Van den Brink, Hermanns, and Schrijvers (2011) concluded that assessment of (early signs of) parenting and developmental problems in very young children, in which we were interested, always proves difficult as no well-validated instruments are available.

With regard to salivary cortisol it is important to note that the cortisol data were not normally distributed even after using logcort transformation. Therefore, it is difficult to interpret the results. However, it is notable that children in both the FFI as the CAU group develop a decrease of morning salivary cortisol and a slight increase of evening cortisol. So we see a time effect but we do not see an intervention effect.

A surprising result was that the EAS scores between the FFI and CAU group appeared to differ significantly in the pretest (significantly lower in FFI group). We cannot explain this observation satisfactorily. We have been very scrupulous in our methodological approach to the RCT; the cases were randomized blindly on forehand. Apparently not all coincidence can be excluded from research. With this in mind a random randomization may not have been the best of choices. A stratification after assessing pretest data could possibly solve the problem of different groups (Kernan, Viscoli, Makuch, Brass, & Horwich, 1999).

6.5.1 Strengths and limitations

This study has some strengths. Applying an RCT-design to evaluate the effects of an intervention aimed at enhancing safe attachment between very young foster children and their temporary carers is important. Many interventions in foster care still are practice based (Van Andel et al., 2014). Researching this topic is important for several reasons. Quite a lot of foster care placements have an unfortunate ending because of a mismatch between foster carer and foster child. This mismatch may arise because of high expectations in idealistic foster carers and/or a lack of basic knowledge of the 'quasi adaptation' very young foster children may show as a coping strategy (Van Andel et al., 2015, submitted). It is important that foster carers learn to observe the child and learn to act in a sensitive way towards the child. The present study presents an evidence base indicating the FFI can be indicated for this purpose.

This study has some limitations. A first limitation refers to the smaller-than-planned sample size, limiting statistical power to find statistical differences. As a second limitation of the study it has to be mentioned that pretest mean differences in FFI and CAU groups exist (except non-intrusiveness). It would have been preferable if both groups had shown the same results and this is the reason that statistical results have to be interpreted with some caution. Nevertheless, from a clinical point of view, it is interesting to note that the carer/children dyads with relatively lower scores on EAS domains profit largely from the intervention.
Another limitation may be that the secondary outcome research instruments do not show the same positive result as in EAS, which was our primary outcome measure. NOSI and salivary cortisol do not show an intervention effect. Results on the EAS are independent of interpretational bias. EAS domains do show a positive intervention effect but the domains have to be rated from a video observation and thus could be susceptible to interpretational bias. We minimized this risk by using a strict protocol.

6.5.2 Conclusion

The results obtained within this study were gathered in a randomized controlled trial with an intervention group (FFI) and a care as usual group (CAU). This study shows a positive effect on relational parameters between foster carers and very young foster children after following a short relational based intervention (FFI), targeting foster carers' ability to observe the child, to interpret its behaviour and to act in a sensitive way. While focusing on enhancing these capacities in foster carers, the (very young) foster child also reacts in a positive way by being more responsive to the carer. The results indicate that the FFI may help to build a secure relationship between foster carer and foster child in a positive way.

6.5.3 Recommendations for future research

We want to underline the importance of developing evidence-based interventions for children being placed in foster care, because these children are at risk. The present study indicates that the FFI may be an intervention reducing these risks for young foster children. Still the results have to be replicated in future research with larger groups. After the results have been replicated in larger groups this will support the FFI as an effective intervention to be used in the early stages of placement to help build a secure relationship between foster carer and foster child. Thus, the FFI can be of value as a preventive intervention in all new placements in foster care with young children. Another recommendation may be to develop research using the FFI to facilitate reunification with birth parents. In the Netherlands, it is custom to reunify very young children with their birth parents when it is deemed to be possible and safety is ensured. The principles used in the FFI to facilitate the relationship between foster carer and child can also be applied to the relationship between birth parent and child. Using these principles properly with birth parents and their children may help to prevent a new out of home placement in the future.

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